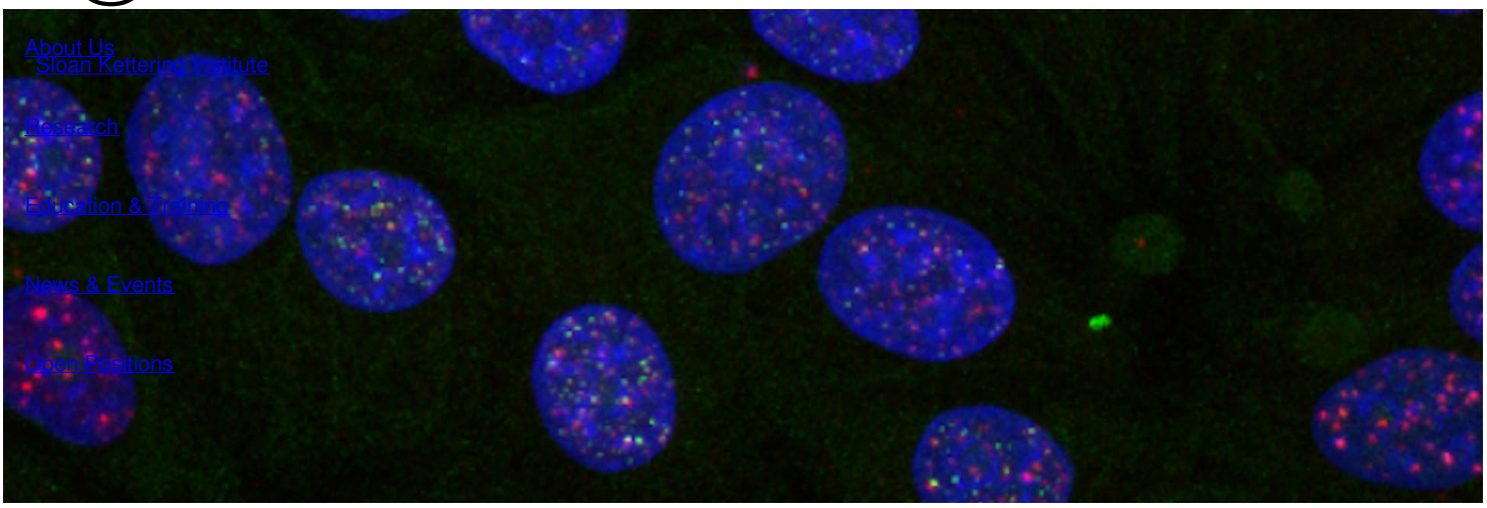

Molecular Biology Program

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The overarching mission of the Molecular Biology Program at SKI is to understand the mechanisms that promote the integrity and expression of genetic information. Defects in the network of pathways that are integrated to preserve genome integrity are highly correlated with malignancy. This network, known as the DNA damage response, comprises DNA repair functions and DNA damage signaling, as well as the downstream outputs of signaling that include apoptosis and transcriptional changes. The focus of our genomic integrity research is on understanding the mechanisms and mediators of the various processes that make up the DNA damage response.

Researchers in our program utilize a broad range of experimental approaches such as genetics in mice, yeast, and bacteria as well as biochemistry, structural biology, and molecular biology to illuminate fundamental mechanistic features of biological processes.
Read more +

Molecular Biology Program Chair John Petrini with computational biologist Christina Leslie

Our Faculty

- John Petrini, PhD
  Chair, Molecular Biology Program
  Molecular biologist John Petrini investigates the repair of chromosomal breaks and the activation of the DNA-damage-induced cell-cycle checkpoints.
- Naama Aviram, PhD
  The Aviram Lab investigates the molecular mechanisms that protect microorganisms from their own pathogenic invaders.
- Prasad Jallepalli, MD, PhD
  Molecular biologist Prasad Jallepalli studies the mechanisms that ensure accurate chromosome transmission in human cells.
- Scott Keeney, PhD
  Molecular biologist Scott Keeney investigates mechanisms of the initiation of meiotic recombination.
- Andrew Koff, PhD
  Molecular biologist Andrew Koff is interested in identifying the genes and and molecular mechanisms by which cells make decisions regarding their proliferative capacity after they exit from the cell cycle during therapy induced senescence and during normal development.
- John Maciejowski, PhD
  Molecular biologist John Maciejowski studies the causes of complex chromosome rearrangements and the patterns of hypermutation that shape cancer genomes.
- Kenneth J. Marians, PhD
  Kenneth Marians focuses on mechanisms of replication restart and chromosome segregation.
- Dirk Remus, PhD
  Molecular biologist Dirk Remus investigates mechanisms of DNA replication in eukaryotic cells.
- Agnel Sfeir, PhD
  The Sfeir Lab investigates pathways that ensure genome fidelity and plasticity.
- Jessica Sheu-Gruttadauria, PhD
  The Sheu-Gruttadauria Lab investigates how biomolecular condensates and biological phase transitions shape gene expression in physiology and disease.
- Stewart Shuman, MD, PhD
  The goal of my research is to understand the mechanisms and structures of enzymes that perform and regulate essential nucleic acid transactions.
- Iestyn Whitehouse, PhD
  Molecular biologist Iestyn Whitehouse investigates chromatin structure and the function of ATP-dependent chromatin remodelling enzymes.
- Xiaolan Zhao, PhD
  Molecular biologist Xiaolan Zhao studies chromosomal organization, genome integrity, DNA replication and repair, dynamic protein modification.

Joint Appointees

- Simon N. Powell, MD, PhD
  Molecular biologist Simon Powell investigates DNA replication and recombination, chromosome dynamics, and human genetics.

Collaborations & Resources

SKI offers a wide array of core facilities and other technologies, as well as significant opportunity for collaboration. Members of the Molecular Biology Program derive particular benefit from close ties to the following:

- Developmental Biology Program
- Structural Biology Program
- Functional Genomics Initiative
- Genome Integrity Discussion Group

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